

N-Channel Enhancement Mode Field Effect Transistor**PRODUCT SUMMARY**

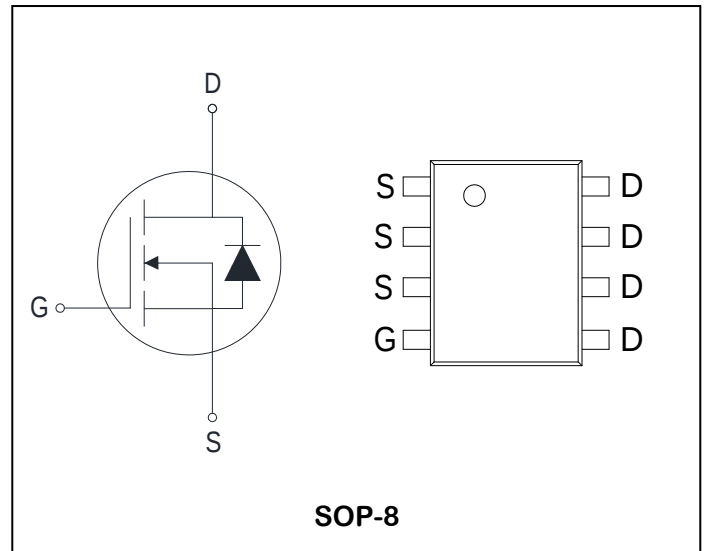
V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω)
100V	13A	9.5m Ω

Features:

- Low Gate Charge for Fast Switching Application
- Low $R_{DS(ON)}$ to Minimize Conductive Loss
- 100% EAS Guaranteed
- Optimized $V_{(BR)DSS}$ Ruggedness
- Green Device Available

Applications:

- Li-Battery Management System
- USB Power Delivery
- BLDC Drive
- Synchronous Rectification
- High Frequency Switching

**Absolute Maximum Ratings** ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Ratings	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		100	V
V _{GSS}	Gate-Source Voltage		± 20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	13	A
Mounted on Large Heat Sink				
I _{DM}	250μs Pulse Drain Current Tested ⁽⁴⁾	T _C =25°C, V _{GS} =10V	120	A
I _D	Continuous Drain Current ⁽¹⁾	T _C =25°C, V _{GS} =10V	13	A
		T _C =100°C V _{GS} =10V	8	A
P _D	Maximum Power Dissipation	T _C =25°C	3.1	W

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max ⁽¹⁾	25	$^\circ\text{C/W}$
R_{thJA}	Thermal resistance junction-ambient max ⁽¹⁾	75	$^\circ\text{C/W}$

Electrical Characteristics (TA=25°C Unless Otherwise Noted)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	100	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V,V _{GS} =0V T _J =25°C	--	--	1	uA
		V _{DS} =80V,V _{GS} =0V T _J =125°C	--	--	100	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1.2	2.0	2.6	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
R _{DS(ON)}	Drain-SourceOn-stateResistance ⁽²⁾	V _{GS} = 10V, I _{DS} =10A	--	8.2	9.5	mΩ
		V _{GS} = 4.5V, I _{DS} =10A	--	11.3	13.5	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, Frequency=1.0MHz	--	1455	--	pF
C _{oss}	Output Capacitance		--	263	--	
C _{rss}	Reverse Transfer Capacitance		--	4	--	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time ⁽¹⁾	V _{DD} =50V, I _D = 10A, V _{GS} = 10V, R _{GEN} =10 Ω	--	6	--	ns
t _r	Turn-on Rise Time ⁽¹⁾		--	4	--	
t _{d(OFF)}	Turn-off Delay Time ⁽¹⁾		--	18	--	
t _f	Turn-off Fall Time ⁽¹⁾		--	3	--	
Q _g	Total Gate Charge ⁽¹⁾	V _{DS} =50V, V _{GS} = 10V, I _{DS} =10A	--	24	--	nC
Q _{gs}	Gate-Source Charge ⁽¹⁾		--	4	--	
Q _{gd}	Gate-Drain Charge ⁽¹⁾		--	6	--	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy ^(3)	V _{DD} =50V,L=0.1mH ,V _{GS} =10 V,R _g =25 Ω , T _J =25°C	31	--	--	mJ
Diode Characteristics						
V _{SD}	Diode Forward Voltage ⁽²⁾	I _{SD} =10A, V _{GS} = 0V ,T _J =25°C	--	0.9	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =10A, dI _{SD} /dt=50A/μs	--	40	--	ns
q _{rr}	Reverse Recovery Charge		--	152	--	nC

NOTES:

1. Surface Mounted on FR4 Board, t ≤ 10 sec.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
3. The Min. value is 100% EAS tested guarantee.
4. Pulse width limited by safe operating area.

Typical Performance Characteristics

Figure 1: Continuous Drain Current vs. T_C

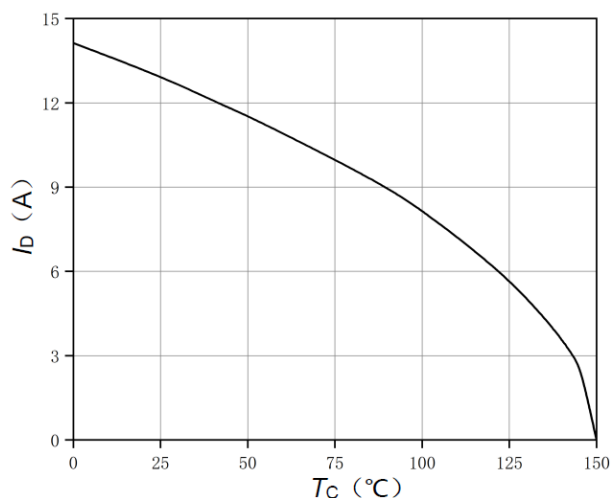


Figure 2: On-Resistance vs. Gate Voltage

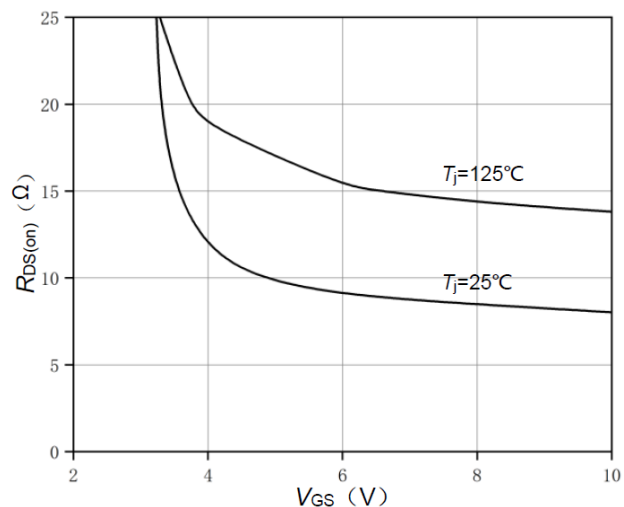


Figure 3: Transfer Characteristics for Various T_j

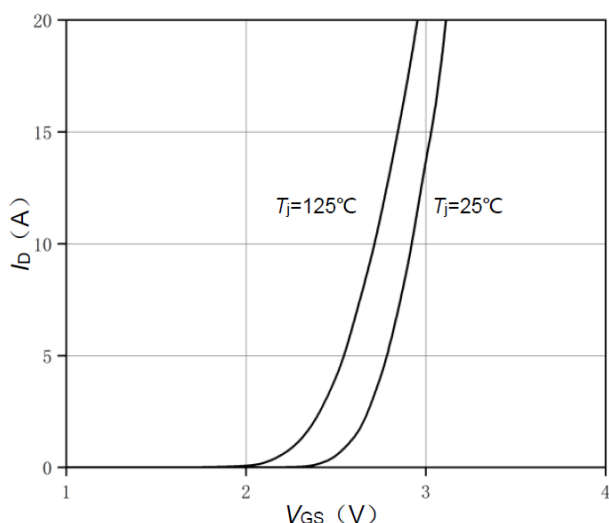


Figure 4: Gate Charge Waveform

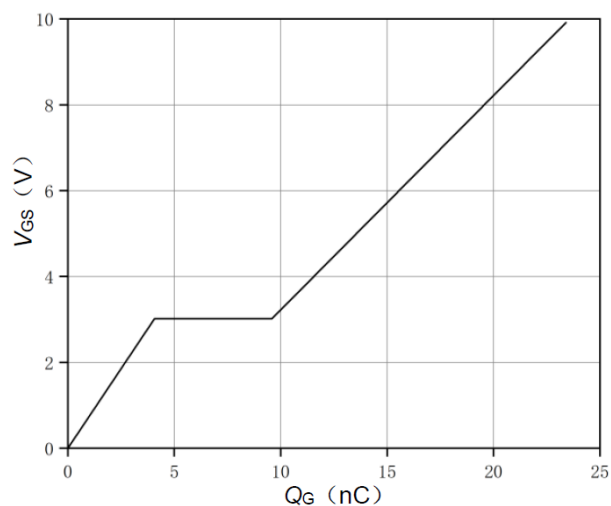


Figure 5: Typical Forward Output Characteristics at $T_j=25^\circ\text{C}$

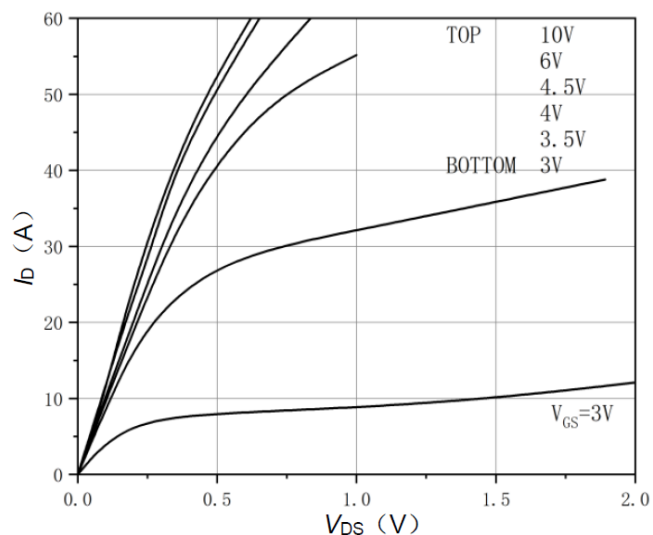


Figure 6: On-Resistance vs. Drain Current

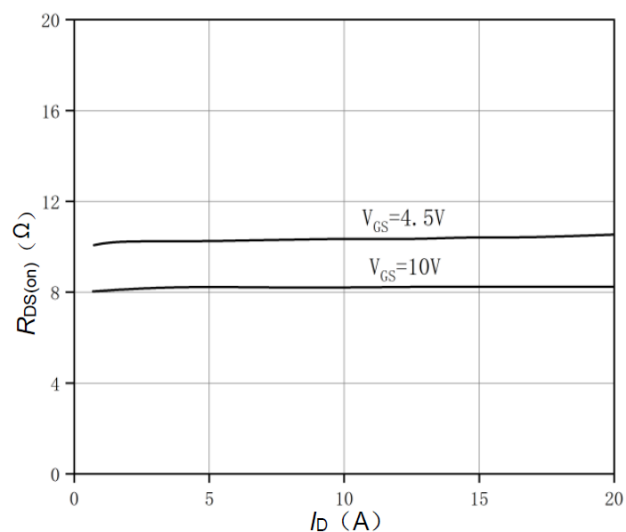


Figure 7: On-Resistance vs.Junction Temperature

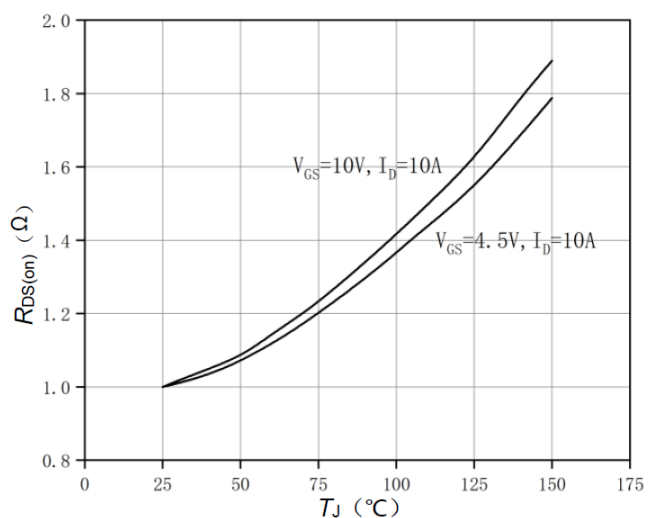


Figure 8: Switching Time Waveform

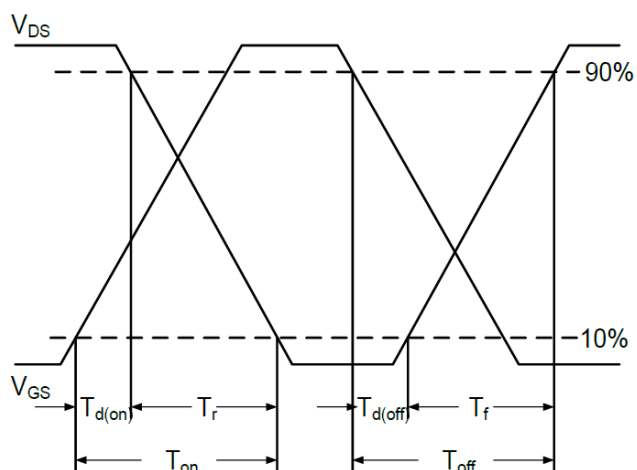
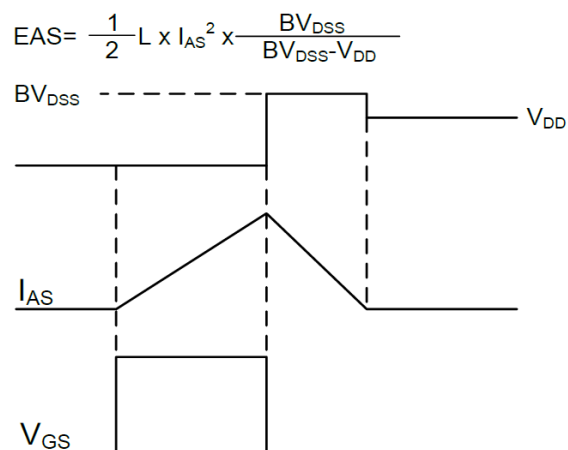
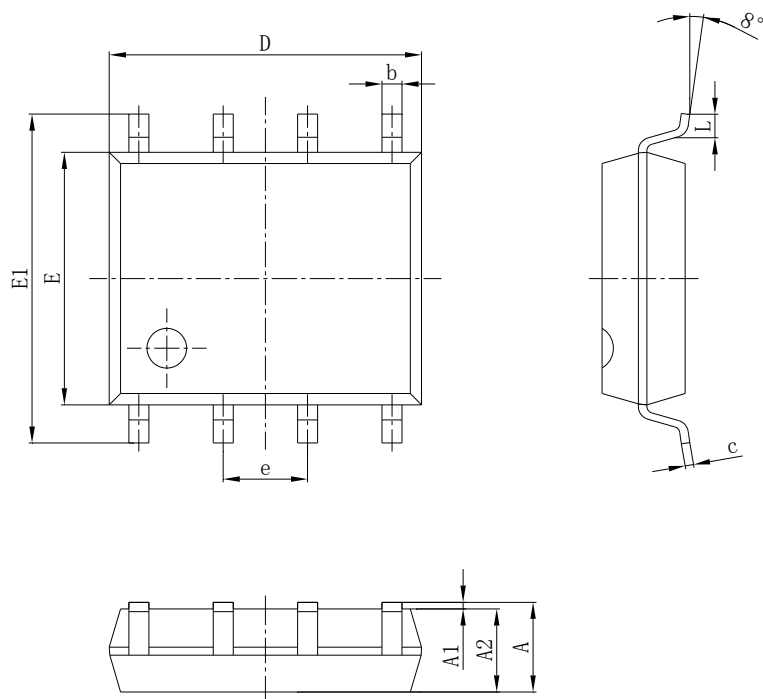


Figure 9: EAS Waveform



PACKAGE MECHANICAL DATA

SOP-8 Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E1	5.800	6.200	0.228	0.244
E	3.800	4.000	0.150	0.157
e	1.270TYP		0.050TYP	
e1	4.500	4.700	0.177	0.185
L	0.400	1.270	0.016	0.050